

Prepared Testimony of

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Good morning, Chairman Metcalfe, Chairman Vitali, and other members of the House Environmental Resources and Energy Committee.

I am Gladys Brown Dutrieuille, Chairman of the Pennsylvania Public Utility Commission (PUC). On behalf of the Commission, I thank you for the invitation to speak at today's informational meeting about electromagnetic pulse (EMP) attacks and electric grid and security.

As Chairman of the PUC, one of my main concerns is the protection of the critical infrastructure of our energy sector partners – whether it is the distribution wires that bring electricity into our homes, the natural gas pipelines that supply heat to our homes in the winter, our water pipelines and wastewater facilities that provide the water we all need, or the telecommunication facilities that connect us to our communities. Keeping all these facilities secure is of utmost importance.

Reliable, resilient energy infrastructure is vital to the safety, security, and economic health of our country. Yet increasingly our nation's infrastructure faces a variety of hazards, from extreme weather to nation-state sponsored attacks. One such potential hazard involves EMPs, which are intense pulses of electromagnetic energy resulting from solar caused effects or man-made nuclear and pulse-power devices. Nuclear EMP has the demonstrated potential to disrupt, damage, or destroy a wide variety of electrical and electronic equipment.¹

The potential for a catastrophic “Black Sky Event,” involving wide-reaching and long-lasting disruptions to our infrastructure, is growing each day. Interdependencies between critical infrastructures and their supply chains only magnify the disruptive effects. It will require exceptional levels of collaboration across federal, state, and local governments, relief agencies, and private sector organizations to build necessary resilience to these hazards.

Public Utility Commission's Role in Security of the Electric Grid

The PUC is the state entity responsible for oversight of the electric distribution utilities (EDCs). This oversight includes ensuring the EDCs have adequate plans and measures regarding physical

¹ US Department of Energy Electromagnetic Pulse Resilience Action Plan, January 2017

and cyber security. The EDCs are also required to have emergency response and business continuity plans to deal with any disruptions.²

While the plans are not required to specifically address issues stemming from EMPs, the EDCs are encouraged to take an all-hazards approach to be able to continue to provide services. However, if there were a full or partial loss of the bulk electric system (BES - essentially all the large electric generators and large transmission lines that feed power to EDCs)³ due to an EMP, the ability of EDCs to provide service would depend on how quickly the functionality of the BES was recovered.

EDCs own and operate the local electric distribution assets in Pennsylvania. The EDCs that the PUC regulates do not own a large portion of the critical facilities susceptible to damage from an EMP. If critical facilities on the BES are damaged by an EMP, that could mean a long-term disruption to the ability of EDCs to provide electricity in certain areas, potentially for months or longer. I do note that the “real-world” impacts of a large EMP (such as that from an air-burst thermonuclear device) have not been established enough to know the full extent of the damage that the BES or electric distribution assets would experience.

The Federal Energy Regulatory Commission (FERC) has oversight of the BES and is responsible for ensuring the physical and cybersecurity of the BES. The PUC has no jurisdiction regarding the security or operation of BES transmission or generation facilities. FERC and the Department of Energy (DOE) would be the Federal agencies tasked with ensuring the physical security of those facilities and for approving standards and actions regarding EMPs for the BES.

The North American Electric Reliability Corporation (NERC) is the organization that develops standards at the behest of FERC. NERC is the national reliability organization that develops and enforces standards.⁴ NERC and the regional reliability organizations then enforce the standards

² See here for PAPUC regulations regarding emergency planning:

<http://www.pacode.com/secure/data/052/chapter101/chap101toc.html>. 52 Pa. Code § 101.

³ The Federal Energy Regulatory Commission and The North American Electric Reliability Corporation define the BES as “all Transmission Elements operated at 100 kV or higher and Real Power and Reactive Power resources [i.e., electric generation] connected at 100 kV or higher” and specifically that the BES “does not include facilities used in the local distribution of electric energy.” <https://www.nerc.com/pa/RAPA/Pages/BES.aspx>.

⁴ For more information on NERC, see here: <http://www.nerc.com/AboutNERC/Pages/default.aspx>.

with FERC having oversight. The Federal Department of Homeland Security (DHS) also has a role as an advisor and resource to privately owned infrastructure.

In addition to the PUC, FERC, and NERC oversight, the regional transmission operator (RTO), PJM, also has a responsibility to ensure owners and operators of the BES have implemented the physical and cyber security measures necessary to maintain the reliability of the BES. PJM operates the RTO in Pennsylvania, Ohio, New Jersey, Maryland, Delaware, West Virginia, the District of Columbia and parts of other Mid-Atlantic regional states (as well as parts of Illinois, Kentucky, Indiana and Michigan). PJM has emergency procedures for BES owners and operators to take precautions and actions, in addition to PJM's own precautions and actions, for threats to the BES.

While the PUC is not aware of any EMP-specific requirements for PJM other than those for geomagnetic disturbances (GMDs), PJM does have emergency procedures to respond to all nature of hazards to the BES. In terms of EMPs, PJM would work with any requirements developed by NERC and required by FERC. Both NERC and PJM are scheduled to testify today and can provide more details on EMPs, as it relates to their oversight.

PUC and State Emergency Response to an EMP

The PUC's Bureau of Technical Utility Services (TUS) is responsible for ensuring that the PUC fulfills its role in the Commonwealth Emergency Operations Plan (CEOP) and Energy Assurance Plan (EAP). The Pennsylvania Emergency Management Agency (PEMA) is the coordinating agency for the CEOP while the Pennsylvania Department of Environmental Protection (DEP) is the coordinating agency for the EAP. The PUC has responsibilities as a support agency for eight of the 15 Emergency Support Function (ESF) annexes in the CEOP. The PUC primarily provides support to ESF-12 Energy, of which DEP is the coordinating agency. TUS' Emergency Preparedness Section (TUS EP) works with PEMA and DEP staff on the CEOP and EAP on day-to-day matters as well as during events that cause disruptions to the electric distribution system and those that may impact the BES. TUS EP, DEP and key staff at the PUC and PEMA have direct contact with PJM when PJM undertakes any significant emergency procedures.

Our TUS EP serves as a direct liaison with PEMA and participates with PEMA and other state agencies in preparing for and responding to events that cause large-scale disruptions to electric service, such as an EMP. TUS EP routinely participates in emergency preparedness exercises with other state agencies such as PEMA and DEP. TUS EP also routinely participates in exercises with EDCs, PJM, DOE, and the Federal Emergency Management Agency (FEMA) – in particular FEMA Region III, which includes Pennsylvania. With DEP, TUS EP works with the DOE on energy assurance planning and participates in conference calls and webinars during large-scale energy emergency events, such as during the May 2021 Columbia Pipeline disruption due to a ransomware cyberattack.

The PUC and other key state agency stakeholders are working on how to prepare Pennsylvania state agencies, private industry, and eventually county and local governments for Black Sky Events.⁵ A significantly sized EMP would likely cause a Black Sky Event. By way of background, the PUC began its training efforts by hosting a Black Sky tabletop exercise in June 2016 with opening remarks by Governor Wolf. Pennsylvania’s Black Sky efforts have continued since then.

Through the Black Sky Event planning efforts, the members of Pennsylvania’s Black Sky Steering Committee⁶ are working to develop initial response actions of government and private sector stakeholders, as well as how restoration of critical lifeline systems may be facilitated and directed, depending on the nature of the disruption. The long-term goal is development of a Black Sky Event Response Annex that may be incorporated into the CEOP, or a stand-alone response process for Pennsylvania.

As a part of the Black Sky Event Steering Committee’s efforts, lifeline sector workgroups consisting of Energy, Water/Wastewater, Communications, and Transportation have been working together to prepare for a Black Sky Event. During such an event, it will be most urgent to reconstitute the backbone infrastructures within the utility lifeline sectors, such as critical communications, so that electric restoration service to customers can occur over time. To ensure

⁵ Black Sky Events (BSEs) are defined as defined as extraordinary and hazardous events that produce power outages of a large, potentially regional scale, that last significantly longer than typical weather or operational outages and may have cascading impacts on other critical infrastructure sectors.

⁶ The BSE Steering Committee is comprised of key state agencies, NGOs, federal partners, and private industry critical infrastructure owners and operators. The BSE Steering Committee includes members from EDCs and PJM.

initial response actions are taken and coordinated effectively during a Black Sky Event, the lifeline workgroups have high-level objectives and assumptions to plan towards. The objectives include identifying responsible independent actions for when conventional communications are disrupted or degraded; identifying emergency communication methods; identifying lifeline sector interdependencies and establishing relationships and needs; identifying critical backbone infrastructure and determining backup power capabilities; and identifying fuel and communication sector needs and gaps across all lifeline sectors.

The PUC and the other Black Sky Event Steering Committee members continue to work together on planning. The next Steering Committee meeting is scheduled for some time in the Fall of 2022.

Closing

I hope my testimony today has detailed the PUC's perspective and role regarding this important topic. The Commission is committed to working with the legislature and other stakeholders across the state to ensure that Pennsylvania's interests are safeguarded, and we stand ready as a resource for any further legislative discussions about this topic. I appreciate the opportunity to testify today and would be happy to address your questions.